ISSN Online: 3006-4708
SOCIAL SCIENCE REVIEW ARCHIVES
ISSN Print: 3006-4694
https://policyjournalofms.com

Investigating the Impact of Technostress on Quality of Life and Thriving at Work Among Healthcare Workers Through Mediating and Moderating Mechanisms

Tuba Aftar[1], Noor ul Ain Munzaid[2], Aswah Khurshid[3], Arooba Arzoo[4]

[1,2,3,4] Riphah International University, Email: tuba.aftar1@gmail.com, noorulain0986@gmail.com, aswahkhurshid@gmail.com, aroobaarzoo67@gmail.com

DOI: https://doi.org/10.70670/sra.v4i1.1627

Abstract

Technostress is a major health issue among allied healthcare workers. Technostress is considered the cause of mental health issues among individuals worldwide. This study aimed to determine the consequences of technostress on quality of life and thriving at work among healthcare workers through the mediating role of work exhaustion and the moderating role of employee resilience. Using structured questionnaires, time lagged data were collected in three waves from allied healthcare workers (n=251), employed in private facilities in Rawalpindi and Islamabad, Pakistan. Applying conservation of resource theory, the investigation reveals that technostress elevates work exhaustion in persons, subsequently resulting in diminished quality of and no effect on thriving at. No evidence has been identified to support the moderating effect of employee resilience on the association between technostress and work exhaustion. Organizations should provide organizational interventions to reduce technostress and promote digital well-being among healthcare professionals as well as addressing work exhaustion can significantly improve quality of life and enhance thriving at work in high-pressure healthcare environments. Technostress causes work exhaustion and decreases the quality of life of allied healthcare workers in Pakistan.

Keywords: Technostress, Exhaustion, Thriving at work, Quality of Life, Employee Resilience

Introduction

Sustainable Development Goal (SDG) 3 confirms health and well-being for all, at every period of life. The World Health Organization said that health is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity". By growing approach to healthcare services, upbringing the standard of care, and addressing social determinants of health at the individual, organizational, and systemic levels, allied health professionals (AHPs) importantly contribute to the decrease of health disparities. By helping multidisciplinary groups in gaining better patient functioning, self-management, and less hospitalizations for complex disorders, allied health workers make a continuous contribution to the management of chronic diseases. In the occupational settings, information and communication technologies (ICTs) have turned commonly recognized in past few years and have recently seen growth from the coronavirus disease 2019 (COVID-19) pandemic. It made distant working arrangements compulsory (Davies, 2021). Technostress, first described by Brod in 1984 as a "contemporary disorder of adjustment," results from individuals' failure to adjust to emerging digital technologies. Due to the quick integration of sophisticated information and communication technologies in clinical settings, which necessitates frequent interaction with digital monitoring systems, electronic health records, and communication tools as well as ongoing skill updating, healthcare professionals are especially susceptible to this phenomenon. This increased incorporation of technology helped to elevate patient outcomes and the efficiency of healthcare delivery, there are compounded technological

burdens including overload, complexity, and intrusion, which can negatively affect medical staff members mental and physical health. Healthcare work is challenging enough, but studies suggest that technostress in healthcare professionals plays a role in symptoms such as exhaustion, burnout and reduced performance levels. ICT users very often need to switch between apps and devices and update their knowledge base. As a result, they feel incapable of proficiently regulating their utilization of ICT (Pansini et al., 2023). When an organization is unable to handle the demands of information technology, techno-stress results. Hospitals' growing dependence on ICTs has sparked worries about how technology would affect medical professionals, who need to keep up with the latest developments to perform their jobs well (Borges do Nascimento et al., 2023; Safi et al., 2018). Expanded levels of technostress can considerably damage employees' attitudes about their jobs, resulting in lower job satisfaction and organizational commitment, in addition have negative health and work results (Borle et al., 2021), and technostress also has an adverse link with thriving at work, which is a key workplace attitude. Besides, technostress was discovered as a foreteller of work exhaustion, hence the pressure created by digital tools may drain individuals' energy, restricting their capability to react to job requirements and causing the feelings of exhaustion (Dragano & Lunau, 2020; La Torre et al., 2019). While previous literature has extensively examined immediate technostress, the complexity of how mediating and moderating variables interact to affect immediate outcomes has often been overlooked. There is a knowledge gap about the impact of technostress in the healthcare industry, particularly in developing nations like Pakistan, as most of the previous studies on the topic have been done in developed or non-healthcare settings. Stress indeed is a global phenomenon as individuals are impacted by diverse circumstances. Hobfoll, in 1989, posited that the core of stress in a resource context is the Conservation of Resources (COR) theoretical lens. The essence of this approach is that people strive to acquire, maintain, and protect resources that are important to them, such as social support, personal energy, and other important assets. In the case of technostress, the resource in question is the individual's energy, well-being and work/life balance. The result of the resource-draining phenomenon is work exhaustion because of excessive technological demands placed on an employee. Stress is sure to increase if the resources in question are threatened or depleted. This exhaustion, in turn, negatively impacts quality of life and thriving at work. However, employee resilience works as a moderating element, helping individuals better manage technostress and preserve their resources, thereby diminishing its adverse effects. Technostress' negative effects can be lowered by resilience-building interventions, such as organizational support networks and training courses (Shaban et al., 2025). Healthcare organizations must establish plans for increasing allied healthcare workers resilience to reduce technostress. This scheme could mean that a work-life balance should be encouraged, a supportive work atmosphere should be created, and sufficient training for new technology should be offered. This study intends to generate a model that explains impact of technostress on quality of life and thriving at work. The study explains impact of technostress on works exhaustion. It intends to find out impact of work exhaustion on quality of life and thriving at work. The objective of study can be summarized by following questions.

- What is the impact of techno-stress on quality of life?
- What is the impact of techno-stress on thriving at work?
- Does work exhaustion mediate the relationship between techno-stress and quality of life?
- Does work exhaustion mediate the relationship between techno-stress and thriving at work?
- Does employee resilience moderate the relationship between techno-stress and work exhaustion?

Literature Review

COR theory

Conservation of Resources (COR) theory developed by Stevan Hobfoll's examines the ways person regulates stress by acquiring, conserving, and managing essential components. COR

theory (Hobfoll, 1989, 2004) was obtained from supply-based and psychological explanations of stress and human aspiration. COR theory is one fundamental belief of the that individuals are Hobfoll`s (COR) theory in 1989, provides a fundamental base for awareness of the psychological effects of technostress on medical personals. In accordance with theory, people work tirelessly to earn, keep on, and defend their resources, including time, energy, emotional stability, and social support. These critical resources are drained in high-demand settings like hospitals, where frequent exposure to digital technologies can cause technostress. Naturally inspired to acquire, safeguard, and promote the acquisition of resources that they value or that contribute to reaching their goals (Hobfoll and Lilly, 1993; Hobfoll, 1989). According to Hobfoll, there are two fundamental principles of COR theory:

Principle 1: Resource waste is far more significant than obtaining a resource, as mentioned in the first principle of COR theory.

Principle 2: The next belief of COR theory mention that men must spend resources to get new ones, repair from losses, and avoid further reserves depletion.

Hobfoll`s (COR) theory in 1989, provides a fundamental base for awareness of the psychological effects of technostress on medical personals. In accordance with theory, people work tirelessly to earn, keep on, and defend their resources, including time, energy, emotional stability, and social support. These critical resources are drained in high-demand settings like hospitals, where frequent exposure to digital technologies can cause technostress. Individuals are more likely to be hurt from work exhaustion when resources decline, which has a deleterious impression on their quality of life and thriving at work.

Techno-stress and Quality of Life

Technostress refers to a term a contemporary maladaptation resulting from an incapacity to engage with emerging digital technologies in a salutary way by Brod in 1984 and the heightened state of excitement exhibited by specific workers who are significantly reliant on computers in their professional tasks (Arnetz & Wiholm 1997) describe the stress that individual faces because of using ICTs. “Technostress," a term which was first used by Brod in 1982, has progressed over time, with the most recent definition relating to "stress experienced by end users of Information and Communication Technologies (ICTs)" (Ragu-Nathan et al., 2008). Techno-stress gives rise to damaging consequences such as anxiety, fear, exhaustion, low-spiritedness, motivation loss, low job performance, and job dissatisfaction in individuals (Jena, 2015a; Tarafdar et al., 2015). Technostress highlights the adverse mental state of people in the modern digital world (Ayyagari et al., 2011). According to previous research, technostress causes memory issues, sleep difficulties (Tarafdar et al., 2011), job dissatisfaction, and poor job performance, all of which have an influence on people's mental and physical health (Ribeiro et al., 2018). The quality of life (QoL) generally reflects the health of communities and, more specifically, the physical and mental well-being of individuals. According to earlier research, human behaviors that cause stress, like IA (Opoku-Acheampong et al., 2017), have a significant effect on people's quality of life. However, the understanding of most individuals, particularly young people, regarding the health repercussions of excessive usage of the internet is poor, which creates various health concerns during the latter stages of life (Arias-Palencia et al., 2015). According to COR theory, individuals exert considerable effort, safeguard, and preserve precious assets (such as time, energy, and mental health). Stress rises and has a detrimental effect on well-being when these resources are endangered or disappear. Technostress (e.g., work overload, constant connectivity, rapid tech changes) decreases cognitive, emotional, and physical resources. This fall of resources results in fatigue, annoyance, and a decline in well-being, all which impacts life quality. Considering COR theory, we can say that technostress drains personal resources, leading to stress and reduced well-being, which in turn lowers quality of life among health care workers.

H1: Techno-stress is significantly negatively associated with Quality of life.

Technostress and Thriving at Work

The combined experience of vitality and learning at work is a sign of thriving. Learning is explained as the condition in which workers gain new expertise and knowledge; vitality means the positive psychological situation in which workers are active and zealous (Spreitzer et al., 2005). Employees who work effectively have a positive work status. According to previous studies, thriving people are more likely to be psychologically positive about their job development and eventually attain job satisfaction if they actively create career objectives and acquire skills for career progress (Chang et al., 2020). Jiang et al. (2021) discovered a supportive link between thriving and career satisfaction, which lends credence to this perspective. Jiang et al. (2020) discuss how thriving affects job satisfaction. Technostress keeps workers from holding on to the energy and knowledge required to succeed at work by emptying their psychological and cognitive reserves. This is verified by COR theory, that technostress depletes the personal resources required for maintaining vitality and ongoing learning, which has a negative effect on healthcare personnel's ability to thrive at work. These workers have minimal resources available to them to aim for professional development or engage in meaningful employment since they invest significant amounts of money to retain performance and adapt to changing technology. Their potential to learn and feel stimulated by two essential elements of thriving is slowed down by this resource depletion, which eventually lowers motivation, job satisfaction, and long-term loyalty to the field. So, technostress has a inverse impact on staffs' thriving at work.

H2: Technostress is significantly negatively associated with thriving at work.

Technostress and Work Exhaustion

Long lasting, extreme physical, emotional, and cognitive stress brought on by extended subjection to specific working conditions or stressors is known as work exhaustion (Demerouti et al., 2003). Regarded as a diminished psychological resource condition, work exhaustion can lower an employee's motivation for their task and send out dangerous indications (Zhao & Jiang, 2021). It can also render employees physically and mentally exhaustion, lacking enthusiasm and morale, and disinterested in organizational matters. Similarly, according to JD-R theory, when professionals encounter increased workloads, they typically utilize resources to address them (Bakker & Demerouti, 2017). When individuals lack sufficient resources to fulfill their job requirements, it results in a state of work-related distress. When there is high techno stress among employees, there will be more work exhaustion. With time, due to advancements in digital technology, individuals must dedicate time and effort to acquire further expertise (Shadbad & Biros, 2020). Increased resource use for learning might often result in employee work exhaustion. In healthcare contexts, where the use of digital technologies and electronic health records is rising quickly, technostress-related work exhaustion can damage both personal health and quality of patient care, recognizing it as a major issue demanding organizational attention (Wang et al., 2022). The Conservation of Resources (COR) theory provides a clear explanation of how healthcare workers' constant depletion of personal and professional resources due to technological stress results in work exhaustion. According to COR theory, as a resource-depleting factor, technostress lowers employees' mental, emotional, and cognitive energy, which leads to work exhaustion. The more employees deal with technostress, the more they exhaust themselves because they are continuously losing personal resources.

H3: Technostress is significantly positively associated with work exhaustion.

Work Exhaustion and Quality of Life

Work exhaustion, characterized by continuous emotional and physical exhaustion, greatly lowers the quality of life among healthcare professionals. This deep-seated exhaustion, a major component of burnout, has been consistently associated with poor general well-being (Kumareswaran & Sundram, 2024). An individual's total life satisfaction and usefulness are presented in their quality of life (QoL), a multifaceted idea that includes their physical and mental health, social interactions, and environmental circumstances (Skevington et al., 2004; Diener et al., 2018). It is forced by socioeconomic determinants like education, work, and social support in addition to health status, all of which have a big effect on people's well-being (Marmot, 2005; Al-Janabi et al., 2012). People who face stress at work daily and are exhausted have voiced more sadness in both their personal and professional lives, as well as more feelings about quitting their careers. A tradition of self-deprivation is maintained by the pressure to perform well under these tiring circumstances, resulting in one's own wellbeing at risk for long-term outcome (Rodriguez-Vega et al., 2020). A practical foundation for understanding the connection between work exhaustion and quality of life is given by the conservation of resources (COR) theory. The COR postulate states that people work to obtain, maintain, and secure their resources, which include valuable personal traits, circumstances, or energies. People may ache from raised stress and a deterioration in their general well-being when these resources are endangered or consumed, as is the case with high work demands that result in burnout. Resource wasting is a strong indicator of increased stress responsiveness, such as life discomfort and job dissatisfaction, according to practical research.

H4: Work exhaustion is significantly negatively associated with quality of life.

Work Exhaustion and Thriving at Work

In research by Khan et al. (2024), it was discovered that a proactive personality and pleasant emotions among employees can increase job prosperity, in accordance with the Conservation of Resources Theory. As stated by Goh et al. (2022), thriving at work can result in improved health and well-being, job attitudes, career development, and job performance. Workers' ability to be involved in the cognitive and emotional processes that support growth, and vitality is diminished when they suffer from work exhaustion, a condition characterized by persistent physical and emotional fatigue (Liu et al., 2023). The negative relation between thriving and exhaustion is further reinforced by the fact that exhausted workers are more probably to experience a resource degradation cycle, where their decreased energy further hinders their capacity to recover and re-engage (Wang et al., 2022) The inverse link between these dimensions implies that employees' ability to thrive decreases in proportion to the severity of work exhaustion. According to COR theory, work exhaustion depletes employees' resource reservoirs, making it difficult for them to learn and stay energized with two essential elements of thriving. Therefore, the conditions needed for thriving at work are directly weakened by the depletion of resources essential to work exhaustion, further solidifying the detrimental association between these notions.

H5: Work exhaustion is significantly negatively associated with thriving at work.

Mediating Role of Work Exhaustion between Technostress and Quality of Life

Technostress, or tension caused by information and communication technology use, has become common in modern organizations. It has been found that employees' job performance and quality of work life are negatively impacted by technostress (Saleem & Malik, 2023). A major element of burnout, emotional tiredness, can result from these stressors, further decreasing employees' quality of life (Consiglio et al., 2023). It has been demonstrated that work exhaustion, which mediates the association between technostress and unfavorable outcomes like turnover intention, is significantly predicted by technostress (Sharma et al., 2025). In the same study, it was seen that in Indian IT companies, technostress not only elevated workers' intents to quit, but it also did so through the

mechanism of work exhaustion. In healthcare settings, there is a well-established inverse relation between high degrees of work exhaustion and lower quality of life in the social, psychological, and physical domains. Research has shown that technological pressures lead to emotional exhaustion, which impacts on workers' general well-being and work-life balance (Ma et al., 2021). This mediating role of work exhaustion argues that the pressure brought on by technostress, which reduces resources, weakens people's efficiency to handle the demands of both their private and professional lives. According to the COR assumptions, humans endeavor significant effort to buy, safeguard, and hold onto the property they value, such as their energy and health. Technostress, which causes work exhaustion and resource reduction, acts as a warning to these resources. People are incapable of attaining a high quality of life because of this loss since they have hardly any resources to deal with daily challenges. For that reason, treatments that lessen technological stress and replace resources are essential to improving staff members' quality of life.

H6: Work exhaustion mediates the relationship between technostress and quality of life.

Mediating Role of Work Exhaustion between Technostress and Thriving at Work

Technostress can diminish employees' ability to thrive in their occupations by increasing work-family conflict, emotional exhaustion, and cognitive overload, with respect to study. Technostress is a situation in which persons who are burdened by digital tool demands may feel more exhausted at work, which decreases their capacity to perform well. The mediation role of work exhaustion concentrates on the depletion of worker's energy reserves, which is at least one way that technostress negatively effects thriving. Long-standing subjection to workplace stressors, such as technostress, can give rise to work exhaustion, which is specified by feelings of fatigue and loss of emotional support (Wright & Cropanzano, 1998). Overwhelmed by the demands of technology, workers may experience more work-related exhaustion, which eventually hinders their ability to thrive. The depletion of workers' energetic resources is at least one way that technostress adversely affects thriving, according to the mediating function of work exhaustion. In the view of COR theory, technostress leads to these resources at risk, leading to resource depletion that manifests as job exhaustion. This exhaustion blocks workers' capacity to participate in thriving-promoting behaviors, such as seizing learning opportunities and maintaining enthusiasm at work. Therefore, from a COR perspective, work exhaustion is an important mediator that explains how technology stress depletes essential resources, which then inhibits workers' capacity to thrive at work.

H7: Work exhaustion mediates the relationship between technostress and thriving at work.

Moderating Role of Employee Resilience between Technostress and Work Exhaustion

Organizational behavior literature has placed a lot of focus on employee resilience, or the ability to overcome obstacles and adjust to hardship. The idea of resilience, however, has only just drawn more attention due to its significance for companies. For example, resilience was found to be marginally connected with work engagement and to be an important indicator of job satisfaction in a cross-sectional study of engineers (Ibrahim & Hussein, 2024). In a study by Mubarak et al. (2022), the moderating role of employees' resilience and mindfulness was discovered, which mitigates the detrimental effects of psychological strain on project success and increases the chances of project success. Study denotes that technostress unfavorably influences workers' well-being, increasing the risk of turnover and reducing productivity (Atrian & Ghobbeh, 2023). In order to minimize the adverse impacts of technostress, employees must be resilient. Analysis by Chen and Wei (2021) investigates how employee resilience might lessen the destructive effects of technostress on job satisfaction, which is closely associated with work exhaustion. The outcomes suggest that high resilience level lowers the negative impacts of technostress and, hence, reduce work exhaustion among health care workers. In accordance with the COR hypothesis, humans invest great effort in acquiring, retaining, and saving the resources they value, such as their time, energy, and mental well-being. Technostress, which can lead to burnout, puts these resources at

risk. On the other hand, resilience serves as a personal resource that can guard against resource depletion, enabling employees to better handle technostress and reducing the likelihood of work exhaustion. Hence, we can hypothesize that

H8: Employee resilience moderates the relationship between technostress and work exhaustion in such a way that the relationship between technostress and work exhaustion is weaker when employee resilience is high

Research Model

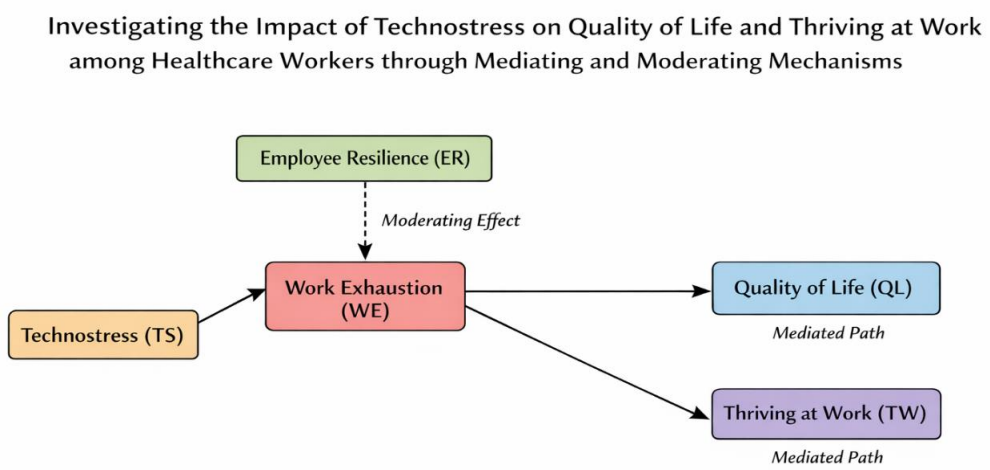

Figure1 Research Model

Methodology

Participants and procedure

The data for this study was collected from allied healthcare workers working in different private hospitals or health clinics located in twin cities of Rawalpindi and Islamabad in Pakistan. This study is quantitative, as data is being collected using a questionnaire. The research was done in actual surroundings, particularly across the healthcare settings, where participants, specifically healthcare professionals completed questionnaires related to their experiences and perceptions in a natural work environment. The present research includes allied healthcare staff performing duties in private healthcare sectors within Rawalpindi and Islamabad. Employees that have working experience of at least 1 year and above are targeted. To mitigated chances of common method bias, timed-lagged data were collected. This investigation used a convenience sampling strategy, and data were collected in three time- lags Time 1, Time 2, and Time 3, conducted at intervals of four weeks. All respondents were assured of data confidentiality and anonymity. The first part (T1) of the structured questionnaire, consist of technostress and demographics, were given to the participants with request to submit as soon as possible. At T1, 450 questionnaires were distributed, out of which 330 respondents returned complete questionnaires. Some questionnaires were not fully completed, while other were on their leave period and some were retired. After four weeks these 330 participants were contacted again to fill out Part 2 (T2) of the questionnaire, comprising items related to work exhaustion. This time, 271 responses were received during the whole week. Following the previous pattern, these 271 respondents were approached again after four additional weeks and were requested to fill out the third part (T3) of the questionnaire, which included items related to quality of life, thriving at work and employee resilience. 251 respondents competed and submit their questionnaires. After the collation of all three parts (T1-T3), the concluding analysis included only population number of 251, constituting a response rate of 91%.English language questionnaires were used in study for data collection purpose. Though English is not national language of Pakistan, it is taught as compulsory subject and is official language of Pakistan. Therefore, translation of questionnaire was not needed as respondent were able to understand it.

Study sample include 176 female and 29.9% were male respondents. In total, 45.8% were in between 20 to 30 years of age, 47% had work experience of 1 to 5 years. 59% participant had their MS/ M.Phil. degree while 21.5% had their bachelor's degree.

Measures

For all measuring scales 5-point Likert scale ranging from strongly disagreed=1 to strongly agree=5 was used.

Technostress

Twelve items for "technostress" were selected and slightly altered from the studies of Tarafdar et al. (2010) will be used to measure technostress. Sample item is "I spend less time with my family due to this technology". The Cronbach alpha for this scale is 0.87.

Work exhaustion

Exhaustion was assessed by the five-item work exhaustion subscale of the General Burnout Questionnaire (Schaufeli et al., 1995). A sample item is "I feel emotionally drained from my work" and the Cronbach Alpha value is 0.85.

Employee Resilience

The 6-item measure designed by Smith et al. (2008) will be employed to calculate employee resilience. An example item is: "I tend to bounce back quickly after hard times" and the Cronbach Alpha value is 0.80.

Quality of life

The 6-item measure created by Kim et al. (2020) was utilized to evaluate quality of life. A sample question includes is: "Do you think your everyday life is complete"? The Cronbach Alpha value is 0.82.

Thriving at Work

10- items scale given by Okros and Virga (2023) was employed to assess thriving at work. One representative question is: "I have energy and spirit". 0.88 is the value for the Cronbach Alpha.

Data Analysis

SPSS (model 22.2) was used for different Statistical analysis. Reliability test employed Cronbach's alpha to estimate the inner scalability and coherency of the scale set. A preliminary statistical assessment involving outlier detection, handling of missing values and frequency distribution were performed to obtain the summary of data's structure and characteristics. Correlation analysis to differentiate the relationships among variables and regression analysis to investigate predictive associations were included as additional analysis. In addition to this, the mediation analysis was done following Hayes's (2013) PROCESS Macro. Confirmatory factor analysis (CFA) was done to check fitness of our model with data using Smart PLS 4.

Results

Preliminary analysis

The predictable correlation between five latent variables is shown in Table 1. Technostress negative correlated with quality of life ($r = -.29$, $p < 0.01$) while technostress and work exhaustion have a significant positive relation ($r = 0.29$, $p < 0.01$). However, the outcome with a value of ($r = - 0.41$, $p<0.01$) among technostress and thriving at work highlighted a significant negative link among them. In addition, value ($r = -2.19$, $p < 0.01$) indicates a substantial negative association between quality of life and work exhaustion.

Table 1: Descriptive statistics and correlation coefficient of variables

Latent construct	M	SD	1	2	3	4	5
1. Technostress	3.74	.32	(.87)				
2. Quality of life	2.37	.55	-.298**	(.82)			
3. Thriving at work	2.48	.63	.307**	-.219**	(.88)		
4. Work exhaustion	3.57	.46	.299**	-.167**	-.046	(.85)	
5. Employee resilience	3.54	.43	-.410**	.460**	-.007	-.475**	(.86)

Notes: n =251; M=Mean; SD= Standard deviation. *p<.05, **p<.01, alpha reliabilities in brackets

Measurement model

Assessment of measurement model is done through convergent and discriminant validity.

Table 2

Factor loading and reliability

Variables	Items	Factor Loading*	CR**	AVE***
Technostress (TS)	TS1	0.78	0.90	0.61
	TS2	0.76		
	TS3	0.74		
	TS4	0.77		
	TS5	0.75		
	TS6	0.73		
	TS7	0.74		
	TS8	0.75		
	TS9	0.76		
	TS10	0.77		
	TS11	0.78		
	TS12	0.79		
Work Exhaustion (WE)	WE1	0.75	0.89	0.59
	WE2	0.73		
	WE3	0.72		
	WE4	0.74		
	WE5	0.71		
Thriving at Work	TW1	0.80	0.91	0.63
	TW2	0.81		
	TW3	0.79		
	TW4	0.82		
	TW5	0.80		
	TW7	0.77		
	TW8	0.79		
	TW9	0.78		
	TW10	0.80		
Quality of Life (QL)	QL1	0.82	0.88	0.65
	QL2	0.83		
	QL3	0.81		
	QL4	0.84		

	QL5	0.83		
	QL6	0.82		
Employee Resilience (ER)	ER1	0.77	0.86	0.60
	ER2	0.75		
	ER3	0.76		
	ER4	0.78		
	ER5	0.74		
	ER6	0.73		

Note: *factor loading after removing items having loading <0.6, **CR of all variables is >0.7, ***AVE of all variables is >0.5

Convergent validity

Convergent validity is established by examination of factor loading, composite reliability (CR) and average variance extracted (AVE) which are given in Table 2. Following the guidelines of Fornell and Larcker (1981) that factor loading should be >0.6, only one item TW6 was eliminated because of low factor loading. All the variables have CR greater than 0.7 and AVE greater than 0.5, therefore fulfilling the criteria set by Henseler et al. (2015).

Discriminant validity

The Fornell-Larcker criteria was used to test the discriminant validity and the purpose of this test is to observe whether each construct is empirically different compared to other constructs in the model. Results displayed in Table 3 show that the diagonal values are high in comparison to the other values, hence, the discriminant validity is established (Hair et al., 2011).

Table 3: Discriminant validity (Fornell and Lacker's criterion)

Constructs	1	2	3	4	5
1 Technostress	0.78				
2 Work exhaustion	0.54	0.77			
3 Thriving at work	-0.42	-0.49	0.79		
4 Quality of life	-0.46	-0.52	-0.58	0.81	
5 Employee resilience	- 0.40	-0.45	0.55	0.57	0.77

Hypothesis testing

The findings of Hypothesis 4 which investigated the impact of work exhaustion (WE) on quality of life (QL) are given in Table 4.1. The results reveal that the relationship between increased work exhaustion and reduced quality of life is negative (b = -0.15, SE = 0.07, t = -2.06, p = 0.03), and thus, the higher the work exhaustion, the lower the quality of the life of healthcare workers. It consisted of two-hundred and fifty-one participants and measured all variables with respect to technostress (TS). These findings confirm the assumption that work-related exhaustion has a negative effect on the general well-being in hospitals.

Table 4.1: Direct and Indirect Effects Hypotheses Testing					
Hypothesis	Relationship	Estimates			
		B	SE	T	P
Direct Effect Hypothesis					
H1	TS→QL	-0.47	0.10	-4.50	0.00
H3	TS→WE	0.43	0.08	5.06	0.00
H4	WE→QL	0.15	0.07	-2.00	0.03
Indirect Effect Hypothesis					
		B	SE	LLC	ULCI
H6	TS→WE→QL	-0.06	0.03	-0.13	0.00

Notes. N=251, TS=**Technostress, WE= Work exhaustion**, QL= **Quality of life**

Table 4.2. the mediated regression analysis of Hypothesis 5. The effect of work exhaustion (WE) on thriving at work (TW). The findings suggest that there is a strong positive correlation between work exhaustion and thriving at work change amongst health workers (b = 0.18, SE = 0.08, t = 2.24, p = 0.02). The study was carried out using a sample of 251 respondents, when it comes to technostress (TS). These results confirm that the relationship between technostress and thriving has a mediating variable and that is work exhaustion.

Table 4.2: Direct and Indirect Effects Hypotheses Testing					
Hypothesis	Relationship	Estimates			
		B	SE	T	P
Direct and Indirect Effects Hypotheses Testing					
H2	TS→TW	-0.85	0.11	-7.20	0.00
H3	TS→WE	0.41	0.08	4.83	0.00
H4	WE→TW	0.18	0.08	2.24	0.02
Indirect Effect Hypothesis					
		B	SE	LLC	ULCI
H6	TS→WE→QL	0.07	0.04	0.00	0.17

Notes. N=251, TL= **Tehnostress, WE= Work exhaustion**, TW= **Thriving at work.**

The findings of the moderated regression can be found in table 4.3, which involves the investigation of the moderating role of employee resilience (ER) between technostress (TS) and work exhaustion (WE). The moderation effect was analyzed in 251 subjects with confidence intervals (LLCI and ULCI) used to determine the significance of the moderation effect. These outcomes give the clue on whether employee resilience moderates the effects of technostress on work exhaustion.

Table 4.3: Moderated Regression Analysis

Predictors	*β*	*SE*	*T*	*p*	*LLCI*	*ULCI*
TS×ER → WE	-.14	.16	-.87	.38	-.45	.17

Notes: N=251; TS= technostress, ER= employee resilience, WE = work exhaustion; LLCI=lower limit confidence interval; ULCI= upper limit confidence interval.

Discussion

The study was based on the Conservation of Resources (COR) theory where the influence of technostress on the quality of life and thriving of healthcare workers in work was considered, work exhaustion was used as the mediator, and employee resilience as moderator. Hypothesis 1, which postulated negative relationships between the quality of life and technostress, was upheld. Unpredictability and lack of comfort is caused by constant technological needs, exhausting cognitive, emotional, and physical resources, which decreases the quality of life and well-being (Golz et al., 2024). COR theory helps understand that loss of resources will cause fatigue, irritation, and reduced quality of life, which means that the healthcare organization should create a policy that minimizes technological stress and engages the frontline employees in the development of digital tools. Hypothesis 2 was also supported, that is, technostress has a negative impact on thriving at work. High technology needs decrease the output capacity of the staff as it decreases job passion and development (Aydin et al., 2024). COR theory shows a decline in job satisfaction due to technostress factors which influence prosperity making supportive leadership and work-life balance essential. Technostress has an indirect impact on the quality of life, as mediated by work exhaustion (Buenadicha-Mateos et al., 2022; Pfleidl et al., 2024). Fatigue lowers the energy, motivation, and psychological resources and provokes a negative spiral of worse performance, detachment, and poor well-being (Molero-Jimenez et al., 2025; Cengiz and Peker, 2025; La Torre et al., 2019). Healthcare employees can remain flourishing in the face of exhaustion because of a high professional purpose, significance of tasks, and coping adaptation (Pansini et al., 2025; Luh et al., 2025). Individual resilience is not strong enough during unrelenting online pressures, with technostress and exhaustion being not significantly mediated by resilience (Pfleidl et al., 2024; Rahimi et al., 2024). Management needs interventions in the organization which are; leadership support, enough staffing, technology compatible with the workflow, and integrated resources and resilience-building initiatives.

Implications

The research would benefit the literature on healthcare management by shedding light on the impact of the technostress on the quality of life and flourishing of healthcare professionals at workplace, and work exhaustion is one of the main mediating processes in which technology requirement progressively reduces motivation and energy. Based on the theory of Conservation of Resources (COR), the results prove that loss of resources caused by the constant technological pressures weakens not only the well-being but also the work performance, and personal resilience might not be effective in a situation of unceasing stressors. The research highlights the significance of putting into consideration the organizational variables, including managerial support, job expectations and the impact of the digital infrastructure, on top of personal resource, in influencing the performance of employees. In practice, these lessons indicate that healthcare companies ought to institute extensive digital literacy initiatives, supportive work culture, develop clear digital communication policies, and develop technology systems that are easy to use to minimize technostress, safeguard work-life stratagem, and boost exhaustion recuperation. The study combines personal, organizational, and technological approaches to giving theoretical and practical recommendations on maintaining the health, engagement, and performance of healthcare workers in workplaces that are becoming increasingly digital.

Limitations and Future Research Directions

The current research contains few constraints that must be considered and will contribute in future research. The information was first gathered from medical professionals in a restricted number of private facilities, perhaps lacking representation of all healthcare professionals nationwide. Future study could broaden its coverage by incorporating medical centers from diverse areas or engaging

healthcare professionals from a wider array of organizations, encompassing both national and private hospitals, to obtain a more define sample. A national examination would be especially beneficial in comprehending the wider context of technostress among healthcare professionals.

The research concentrates particularly on allied healthcare workers in hospitals, however upcoming research could cover wide group of health staff from different regions, including primary care, walk-in clinics, and extended care facilities. By incorporating diverse groups of healthcare professionals, such as physicians, nurses, allied health workers, and administrative personnel, investigators could increase a best recognition of how technostress impacts work exhaustion and stop thriving and quality of life among different characters. Moreover, growing the sample to cover healthcare professionals from diverse age demographics, socioeconomic backgrounds, and levels of skillfulness could provide insights into how these individual characteristics affect the detrimental effect of technostress.

Even though employee resilience was not acknowledged as a significant variable in the relationship between technostress and work exhaustion, future study should investigate additional actual moderators of the given relation. Variables such as attentiveness, social support, self-control, and attributes (e.g., emotional resilience, hopefulness) may add to decrease the harmful effects of technostress on work-related exhaustion in healthcare personals. However, subsequent research could study additional psychological or behavioral variables that mediate the connection between technostress and emotional results, like self-worth, coping strategies, or social ties within the working environment. Future research can enhance the comprehension of these processes by examining a broader array of moderating and mediating variables.

Conclusion

This study discusses the complex dynamics of technostress and its profound impacts on healthcare workers' well-being, with a particular emphasis on quality of life and thriving at work. According to the established theories, technostress has a negative impact by sharply lowering both thriving and quality of life while concurrently raising work-related exhaustion. It is demonstrated that work exhaustion plays a mediating function, emphasizing that it is a key mechanism via which the demands of digital life undermine wellbeing. These results highlight how, despite being necessary for improving healthcare, the adoption of new technology brings with it heavy psychological and physical costs that make it more difficult for healthcare workers to lead fulfilling, balanced, and healthy work lives. The relation between technostress and thriving was not mediated by work exhaustion, as anticipated, and association among technostress and exhaustion was not significantly moderated by employee resilience. These findings imply that when organizational and system-level stressors are high, the buffering benefits of psychological resources and individual coping mechanisms are restricted. According to the findings, healthcare companies must prioritize developing resource-rich, supportive work environments that promote both professional and personal well-being in addition to lowering technology burdens and work-related exhaustion.

References

Al-Janabi, H., N Flynn, T., & Coast, J. (2012). Development of a self-report measure of capability wellbeing for adults: the ICECAP-A. *Quality of Life Research*, *21*, 167-176.

Arias-Palencia, N. M., Solera-Martínez, M., Gracia-Marco, L., Silva, P., Martínez-Vizcaíno, V., García-Prieto, J., & Sánchez-López, M. (2015). Levels and patterns of objectively assessed physical activity and compliance with different public health guidelines in university students. *PloS one*, *10*(11), e0141977

Arnetz, B. B., & Wiholm, C. (1997). Technological stress: Psychophysiological symptoms in modern offices. *Journal of Psychosomatic Research*, *43*(1), 35-42.

Atrian, A., & Ghobbeh, S. (2023). Technostress and job performance: Understanding the impact on healthcare professionals. *Journal of Business and Management studies, 5(5), 1-9.*

Ayyagari, R., Grover, V., & Purvis, R. L. (2011). Technostress: Technological antecedents and implications. *MIS Quarterly, 35*(4), 831–858.

Aydin, G., Kilic, M., & Ozsari, G. (2024). The mediating role of occupational stress in the relationship between technostress and thriving at work among nurses: *A cross-sectional study. Nursing Open, 11(2), e2085. https://doi.org/10.1002/nop2.2085*

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology, 22*(3), 273–285.

Borges do Nascimento, I. J., Abdulazeem, H., Vasanthan, L. T., Martinez, E. Z., Zucoloto, M. L., Østengaard, L., ... & Novillo-Ortiz, D. (2023). Barriers and facilitators to utilizing digital health technologies by healthcare professionals. *NPJ Digital Medicine*, *6*(1), 161.

Borle, P., Reichel, K., Niebuhr, F., & Voelter-Mahlknecht, S. (2021). How are techno-stressors associated with mental health and work outcomes? A systematic review of occupational exposure to information and communication technologies within the technostress model. *International Journal of Environmental Research and Public Health, 18*(16), 8673.

Buenadicha-Mateos, M., Sánchez-Hernández, M. I., & González-López, Ó. R. (2022). Analysis of the emotional exhaustion derived from techno-stress in the next generation of qualified employees. *Frontier in Psychology, 13*, 792606.

Cengiz, S., & Peker, A. (2025). Mental health in the "era" of artificial intelligence: Technostress and the perceived impact on anxiety and depressive disorders—An SEM analysis. *Frontiers in Psychology, 16, Article 1600013. https://doi.org/10.3389/fpsyg.2025.1600013*

Chang, W., Busser, J., & Liu, A. (2020). Authentic leadership and career satisfaction: The mediating role of thriving and the conditional effect of psychological contract fulfillment. *International Journal of Contemporary Hospitality Management, 32(6), 2117-2136.*

Chen, Y., & Wei, S. (2021). Employee resilience as a moderator between technostress and job satisfaction: A study of the banking sector in China. *Journal of Organizational and End User Computing*, 33(4), 1-19.

Consiglio, C., Massa, N., Sommovigo, V., & Fusco, L. (2023). Techno-stress creators, burnout and psychological health among remote workers during the pandemic: The moderating role of E-work self-efficacy. *International Journal of Environmental Research and Public Health*, *20*(22), 7051.

Davies, A. (2021). COVID-19 and ICT-supported remote working: Opportunities for rural economies. *World*, *2*(1), 139-152.

Demerouti, E., Bakker, A. B., Vardakou, I., & Kantas, A. (2003). The convergent validity of two burnout instruments: A multitrait-multimethod analysis. *European Journal of Psychological Assessment, 19(1), 12-23.*

Diener, E., Oishi, S., & Tay, L. (2018). Advances in subjective well-being research. *Nature human behaviour*, *2*(4), 253-260.

Dragano, N., & Lunau, T. (2020). Technostress at work and mental health: concepts and research results. *Current opinion in Psychiatry*, *33*(4), 407-413

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No.1, pp.39-50.

Goh, Z., Eva, N., Kiazad, K., Jack, G. A., De Cieri, H., & Spreitzer, G. M. (2022). An integrative multilevel review of thriving at work: Assessing progress and promise. *Journal of Organizational Behavior*, *43*(2), 197-213.

Golz, C., Eichenberger, N. L., Souissi, S. B., & Bieri, J. S. (2024). Examining the technostress dimensions and job satisfaction in nursing–A cross-sectional study. In *Innovation in Applied Nursing Informatics* (pp. 311-315).

Hair, J.F., Ringle, C.M. and Sarstedt, M. (2011), "PLS-SEM: indeed, a silver bullet*", Journal of Marketing Theory and Practice, Vol. 19No. 2, pp.139-152.*

Henseler, J., Ringle, C.M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43(1), 115-135.*

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *American Psychologist*, *44*(3), 513.

Hobfoll, S. E., & Lilly, R. S. (1993). Resource conservation as a strategy for community psychology. *Journal of Community Psychology*, *21*(2), 128-148.

Hobfoll, S. E. (2004). *Stress, culture, and community: The psychology and philosophy of stress*. Springer Science & Business Media.

Ibrahim, B. A., & Hussein, S. M. (2024). Relationship between resilience at work, work engagement and job satisfaction among engineers: a cross-sectional study. *BMC Public Health*, *24*(1), 1077.

Jena, R. K. (2015). Technostress in ICT enabled collaborative learning environment: An empirical study among Indian academician. *Computers in Human Behavior*, *51*, 1116-1123

Jiang, Z., Di Milia, L., Jiang, Y., & Jiang, X. (2020). Thriving at work: A mentoring-moderated process linking task identity and autonomy to job satisfaction. *Journal of Vocational Behavior*, *118*, 103373.

Jiang, Z., Jiang, Y., & Nielsen, I. (2021). Thriving and career outcomes: The roles of achievement orientation and resilience. *Human Resource Management Journal*, *31*(1), 143-164.

Khan, A. N., Mehmood, K., Le, J., & Khan, N. A. (2024). Visionary leadership and leaders' burnout: a weekly diary analysis. *Asia Pacific Journal of Management*, *41*(3), 1571-1600.

Kim, J., Schmöcker, J. D., Nakamura, T., Uno, N., & Iwamoto, T. (2020). Integrated impacts of public transport travel and travel satisfaction on quality of life of older people. *Transportation research part A: policy and practice*, *138*, 15-27.

Kumareswaran, S., & Sundram, B. M. (2024). Burnout and Patient Care Quality: a Systematic Review of the Impact on Healthcare Workers. *Philippine Journal of Science*, *153*(5).

La Torre, G., Esposito, A., Sciarra, I., & Chiappetta, M. (2019). Definition, symptoms and risk of techno-stress: a systematic review. *International Archives of Occupational and Environmental Health*, *92*, 13-35.

Liu, Y., Wang, H., & Wu, Y. J. (2023). How and when job burnout influences thriving at work: The role of psychological capital and perceived organizational support. *Current Psychology.*

Luh, W.-M., Chang, Y.-C., & Lee, C.-H. (2025). Occupational health and performance among Chinese university teachers: A COR theory model of health-promoting leadership and burnout. *International Journal of Environmental Research and Public Health, 22(4), 512.*

Ma, J., Ollier-Malaterre, A., & Lu, C. Q. (2021). The impact of techno-stressors on work–life balance: The moderation of job self-efficacy and the mediation of emotional exhaustion. *Computers in Human Behavior*, *122*, 106811.

Marmot, M. (2005). Social determinants of health inequalities. *The Lancet*, *365*(9464), 1099-1104.

Molero-Jiménez, M. D., Pérez-Fuentes, M. C., Simón-Moreno, M. A., & Garzón-Umerenkova, A. (2025). The associated factors of work engagement, work overload, work satisfaction, and emotional exhaustion and their effect on healthcare workers: *A cross-sectional study. Healthcare, 13(2), Article 162. https://doi.org/10.3390/healthcare13020162*

Mubarak, N., Khan, J., & Khan, A. K. (2022). Psychological distress and project success: The moderating role of employees' resilience and mindfulness. *International Journal of Project Management*, *40*(5), 566-576.

Okros , N., & Virga, D. (2023). Evaluating the psychometric properties of Romanian version of thriving at work scale. *European Journal of Psychological Assessment*.

Opoku-Acheampong, A., Kretchy, I. A., Acheampong, F., Afrane, B. A., Ashong, S., Tamakloe, B., & Nyarko, A. K. (2017). Perceived stress and quality of life of pharmacy students in University of Ghana. *BMC Research Notes*, *10*, 1-7.

Pansini, M., Buonomo, I., De Vincenzi, C., Ferrara, B., & Benevene, P. (2023, February). Positioning technostress in the JD-R model perspective: a systematic literature review. In *Healthcare* (Vol. 11, No. 3, p. 446).

Pfleidl, L., Pößnecker, W., & Korunka, C. (2024). Technostress and its consequences in healthcare: The role of social climate and job control. *International Archives of Occupational and Environmental Health,* 97(3), 245–256.

Rahimi, B., Nadri, H., & Timpka, T. (2024). Technostress among healthcare professionals: A cross-sectional study in Iranian hospitals. *BMC Health Services Research, 24(1), Article 145. https://doi.org/10.1186/s12913-024-10567-8*

Ribeiro, Í. J., Pereira, R., Freire, I. V., de Oliveira, B. G., Casotti, C. A., & Boery, E. N. (2018). Stress and quality of life among university students: A systematic literature review. *Health Professions Education*, *4*(2), 70-77.

Rodriguez-Vega, B., Palao, Á., Muñoz-Sanjose, A., Torrijos, M., Aguirre, P., Fernández, A., ... & Bayón, C. (2020). Implementation of a mindfulness-based crisis intervention for frontline healthcare workers during the COVID-19 outbreak in a public general hospital in Madrid, Spain. *Frontiers in Psychiatry*, *11*, 562578.

Safi, S., Thiessen, T., & Schmailzl, K. J. (2018). Acceptance and resistance of new digital technologies in medicine: qualitative study. *JMIR research protocols*, *7*(12), e11072.

Saleem, F., Chikhaoui, E., & Malik, M. I. (2023). Technostress, quality of work life, and job performance: A moderated mediation model. *Behavioral Sciences, 13*(12), 1014. https://doi.org/10.3390/bs13121014

Schaufeli, W. B., Leiter, M. P., & Kalimo, R. (1995, September). The General Burnout Inventory: A self-report questionnaire to assess burnout at the workplace. In *Work, Stress, and Health Conference* (Vol. 95, No. 9, pp. 14–16).

Shaban, M., Ezzelregal Abdelgawad, M., & Mohamed Elsayed, S. (2025). The mediating role of emotional intelligence in the relationship between technostress and burnout prevention among critical care nurses: A structural equation modelling approach. *BMC Nursing*, 24, Article 852.

Shadbad, F. N., & Biros, D. (2020). Technostress and its influence on employee information security policy compliance. *Information Technology & People, 35(1), 119-141.*

Sharma, I., Tiwari, V., Gupta, S., & Rana, N. P. (2025). Examining the nexus between technostress and turnover intention: the moderating influence of PsyCap in Indian information management contexts. *Journal of Enterprise Information Management*, *38*(2), 450-473.

Skevington, S. M., Lotfy, M., & O'Connell, K. A. (2004). The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. *Quality of Life Research*, *13*, 299-310.

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: assessing the ability to bounce back. *International Journal of Behavioral Medicine*, *15*, 194-

Spreitzer, G., Sutcliffe, K., Dutton, J., Sonenshein, S., & Grant, A. M. (2005). A socially embedded model of thriving at work. *Organization Science*, *16*(5), 537-549.

Tarafdar, M., Tu, Q., & Ragu-Nathan, A. T. (2010). Impact of technostress on end-user satisfaction and performance. *Journal of Management Information Systems, 27*(3), 303-334.

Tarafdar, M., Tu, Q., Ragu-Nathan, T. S., & Ragu-Nathan, B. S. (2011). Crossing to the dark side: examining creators, outcomes, and inhibitors of technostress. *Communications of the ACM*, *54*(9), 113-120.

Tarafdar, M., Pullins, E. B., & Ragu-Nathan, T. S. (2015). Technostress: negative effect on performance and possible mitigations. *Information Systems Journal*, *25*(2), 103-132.

Wang, K., Manning, R. B., Bogart, K. R., Adler, J. M., Nario-Redmond, M. R., Ostrove, J. M., & Lowe, S. R. (2022). Predicting depression and anxiety among adults with disabilities during COVID-19 pandemic. *Rehabilitation Psychology, 67(2), 179-188.*

Wright, T. A., & Cropanzano, R. (1998). Emotional exhaustion as a predictor of job performance and voluntary turnover. *Journal of Applied Psychology*, *83*(3), 486.

Zhao, H., & Jiang, J. (2021). Role stress, emotional exhaustion, and knowledge hiding: the joint moderating effects of network centrality and structural holes. *Baltic Journal of Management, 16(2), 172-193.*